TG/HEUCH(proj.4)
ORIGINAL: English
DATE: 2011-09-16

UPOV

INTERNATIONAL UNION FOR THE PROTECTION OF NEW VARIETIES OF PLANTS

GENEVA

DRAFT

HEUCHERA;
HEUCHERELLA *

UPOV Code: HEUCH; HEUCL

Heuchera L.;
x*Heucherella* H. R. Wehrh.

GUIDELINES

FOR THE CONDUCT OF TESTS

FOR DISTINCTNESS, UNIFORMITY AND STABILITY

prepared by an expert from the United Kingdom

to be considered by the

the Technical Working Party for Ornamental Plants and Forest Trees
at its forty-forth session, to be held in Fukuyama City, Hiroshima Prefecture, Japan,
from November 7 to 11, 2011

Alternative Names:*

Botanical name	*English*	*French*	*German*	*Spanish*
Heuchera L.	Heuchera Coral Flower	Heuchera	Purpurglöckchen	
x*Heucherella* H. R. Wehrh., Heuchera x Tiarella	Heucherella			

The purpose of these guidelines ("Test Guidelines") is to elaborate the principles contained in the General Introduction (document TG/1/3), and its associated TGP documents, into detailed practical guidance for the harmonized examination of distinctness, uniformity and stability (DUS) and, in particular, to identify appropriate characteristics for the examination of DUS and production of harmonized variety descriptions.

ASSOCIATED DOCUMENTS

These Test Guidelines should be read in conjunction with the General Introduction and its associated TGP documents.

* These names were correct at the time of the introduction of these Test Guidelines but may be revised or updated. [Readers are advised to consult the UPOV Code, which can be found on the UPOV Website (www.upov.int), for the latest information.]

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1. Subject of these Test Guidelines

These Test Guidelines apply to all varieties of *Heuchera* L. and x*Heucherella* H. R. Wehrh..

2. Material Required

2.1 The competent authorities decide on the quantity and quality of the plant material required for testing the variety and when and where it is to be delivered. Applicants submitting material from a State other than that in which the testing takes place must ensure that all customs formalities and phytosanitary requirements are complied with.

2.2 The material is to be supplied in the form of young plants capable of expressing all relevant characteristics of the variety during the first growing cycle.

2.3 The minimum quantity of plant material, to be supplied by the applicant, should be:

10 young plants.

2.4 The plant material supplied should be visibly healthy, not lacking in vigor, nor affected by any important pest or disease.

2.5 The plant material should not have undergone any treatment which would affect the expression of the characteristics of the variety, unless the competent authorities allow or request such treatment. If it has been treated, full details of the treatment must be given.

3. Method of Examination

3.1 Number of Growing Cycles

The minimum duration of tests should normally be a single growing cycle.

3.2 Testing Place

Tests are normally conducted at one place. In the case of tests conducted at more than one place, guidance is provided in TGP/9 “Examining Distinctness”.

3.3 Conditions for Conducting the Examination

3.3.1 The tests should be carried out under conditions ensuring satisfactory growth for the expression of the relevant characteristics of the variety and for the conduct of the examination.

3.3.2 Observation of color by eye

Because daylight varies, color determinations made against a color chart should be made either in a suitable cabinet providing artificial daylight or in the middle of the day in a room without direct sunlight. The spectral distribution of the illuminant for artificial daylight should conform with the CIE Standard of Preferred Daylight D 6500 and should fall within

the tolerances set out in the British Standard 950, Part I. These determinations should be made with the plant part placed against a white background. The color chart and version used should be specified in the variety description.

3.4 Test Design

3.4.1 Each test should be designed to result in a total of at least 10 plants.

3.4.2 The design of the tests should be such that plants or parts of plants may be removed for measurement or counting without prejudice to the observations which must be made up to the end of the growing cycle.

3.5 Additional Tests

Additional tests, for examining relevant characteristics, may be established.

4. Assessment of Distinctness, Uniformity and Stability

4.1 Distinctness

4.1.1 General Recommendations

It is of particular importance for users of these Test Guidelines to consult the General Introduction prior to making decisions regarding distinctness. However, the following points are provided for elaboration or emphasis in these Test Guidelines.

4.1.2 Consistent Differences

The differences observed between varieties may be so clear that more than one growing cycle is not necessary. In addition, in some circumstances, the influence of the environment is not such that more than a single growing cycle is required to provide assurance that the differences observed between varieties are sufficiently consistent. One means of ensuring that a difference in a characteristic, observed in a growing trial, is sufficiently consistent is to examine the characteristic in at least two independent growing cycles.

4.1.3 Clear Differences

Determining whether a difference between two varieties is clear depends on many factors, and should consider, in particular, the type of expression of the characteristic being examined, i.e. whether it is expressed in a qualitative, quantitative, or pseudo-qualitative manner. Therefore, it is important that users of these Test Guidelines are familiar with the recommendations contained in the General Introduction prior to making decisions regarding distinctness.

4.1.4 Number of Plants / Parts of Plants to be Examined

Unless otherwise indicated, for the purposes of distinctness, all observations on single plants should be made on 9 plants or parts taken from each of 9 plants and any other observations made on all plants in the test, disregarding any off-type plants.

4.1.5 Method of Observation

The recommended method of observing the characteristic for the purposes of distinctness is indicated by the following key in the second column of the Table of Characteristics (see document TGP/9 "Examining Distinctness", Section 4 "Observation of characteristics"):

MG: single measurement of a group of plants or parts of plants
MS: measurement of a number of individual plants or parts of plants
VG: visual assessment by a single observation of a group of plants or parts of plants
VS: visual assessment by observation of individual plants or parts of plants

Type of observation: visual (V) or measurement (M)

"Visual" observation (V) is an observation made on the basis of the expert's judgment. For the purposes of this document, "visual" observation refers to the sensory observations of the experts and, therefore, also includes smell, taste and touch. Visual observation includes observations where the expert uses reference points (e.g. diagrams, example varieties, side-by-side comparison) or non-linear charts (e.g. color charts). Measurement (M) is an objective observation against a calibrated, linear scale e.g. using a ruler, weighing scales, colorimeter, dates, counts, etc.

Type of record: for a group of plants (G) or for single, individual plants (S)

For the purposes of distinctness, observations may be recorded as a single record for a group of plants or parts of plants (G), or may be recorded as records for a number of single, individual plants or parts of plants (S). In most cases, "G" provides a single record per variety and it is not possible or necessary to apply statistical methods in a plant-by-plant analysis for the assessment of distinctness."

In cases where more than one method of observing the characteristic is indicated in the Table of Characteristics (e.g. VG/MG), guidance on selecting an appropriate method is provided in document TGP/9, Section 4.2.

4.2 Uniformity

4.2.1 It is of particular importance for users of these Test Guidelines to consult the General Introduction prior to making decisions regarding uniformity. However, the following points are provided for elaboration or emphasis in these Test Guidelines:

4.2.2 For the assessment of uniformity of vegetatively propagated varieties, a population standard of 1% and an acceptance probability of at least 95% should be applied. In the case of a sample size of 10 plants, 1 off-type is allowed.

4.3 Stability

4.3.1 In practice, it is not usual to perform tests of stability that produce results as certain as those of the testing of distinctness and uniformity. However, experience has demonstrated that, for many types of variety, when a variety has been shown to be uniform, it can also be considered to be stable.

4.3.2 Where appropriate, or in cases of doubt, stability may be further examined by testing a new plant stock to ensure that it exhibits the same characteristics as those shown by the initial material supplied.

5. Grouping of Varieties and Organization of the Growing Trial

5.1 The selection of varieties of common knowledge to be grown in the trial with the candidate varieties and the way in which these varieties are divided into groups to facilitate the assessment of distinctness are aided by the use of grouping characteristics.

5.2 Grouping characteristics are those in which the documented states of expression, even where produced at different locations, can be used, either individually or in combination with other such characteristics: (a) to select varieties of common knowledge that can be excluded from the growing trial used for examination of distinctness; and (b) to organize the growing trial so that similar varieties are grouped together.

5.3 The following have been agreed as useful grouping characteristics:

(a) Fully expanded leaf blade: color covering the greatest surface area, with the following groups:
Gr. 1: white
Gr. 2: light yellow
Gr. 3: medium yellow
Gr. 4: yellow green
Gr. 5: light green
Gr. 6: medium green
Gr. 7: dark green
Gr. 8: yellow brown
Gr. 9: pink
Gr. 10: red
Gr. 11: red brown
Gr. 12: brown
Gr. 13: purple
Gr. 14: grey purple
Gr. 15: grey green
Gr. 16: grey
Gr. 17: blackish

(b) Fully expanded leaf blade: color covering the next greatest surface area, with the following groups:
Gr. 1: white
Gr. 2: light yellow
Gr. 3: medium yellow
Gr. 4: yellow green
Gr. 5: light green
Gr. 6: medium green
Gr. 7: dark green
Gr. 8: yellow brown
Gr. 9: pink

Gr. 10: red
Gr. 11: red brown
Gr. 12: brown
Gr. 13: purple
Gr. 14: grey purple
Gr. 15: grey green
Gr. 16: grey
Gr. 17: blackish

(c) Flower: color of outer surface (characteristic 64), with the following groups:
Gr. 1: greenish
Gr. 2: white
Gr. 3: cream
Gr. 4: light pink
Gr. 5: medium pink
Gr. 6: dark pink
Gr. 7: red

5.4 Guidance for the use of grouping characteristics, in the process of examining distinctness, is provided through the General Introduction and document TGP/9 "Examining Distinctness".

6. Introduction to the Table of Characteristics

6.1 Categories of Characteristics

6.1.1 Standard Test Guidelines Characteristics

Standard Test Guidelines characteristics are those which are approved by UPOV for examination of DUS and from which members of the Union can select those suitable for their particular circumstances.

6.1.2 Asterisked Characteristics

Asterisked characteristics (denoted by *) are those included in the Test Guidelines which are important for the international harmonization of variety descriptions and should always be examined for DUS and included in the variety description by all members of the Union, except when the state of expression of a preceding characteristic or regional environmental conditions render this inappropriate.

6.2 States of Expression and Corresponding Notes

6.2.1 States of expression are given for each characteristic to define the characteristic and to harmonize descriptions. Each state of expression is allocated a corresponding numerical note for ease of recording of data and for the production and exchange of the description.

6.2.2 In the case of qualitative and pseudo-qualitative characteristics (see Chapter 6.3), all relevant states of expression are presented in the characteristic. However, in the case of quantitative characteristics with 5 or more states, an abbreviated scale may be used to minimize the size of the Table of Characteristics. For example, in the case of a quantitative

characteristic with 9 states, the presentation of states of expression in the Test Guidelines may be abbreviated as follows:

State	Note
small	3
medium	5
large	7

However, it should be noted that all of the following 9 states of expression exist to describe varieties and should be used as appropriate:

State	Note
very small	1
very small to small	2
small	3
small to medium	4
medium	5
medium to large	6
large	7
large to very large	8
very large	9

6.2.3 Further explanation of the presentation of states of expression and notes is provided in document TGP/7 “Development of Test Guidelines”.

6.3 Types of Expression

An explanation of the types of expression of characteristics (qualitative, quantitative and pseudo-qualitative) is provided in the General Introduction.

6.4 Example Varieties

Where appropriate, example varieties are provided to clarify the states of expression of each characteristic.

6.5 Legend

(*) Asterisked characteristic – see Chapter 6.1.2

QL Qualitative characteristic – see Chapter 6.3
QN Quantitative characteristic – see Chapter 6.3
PQ Pseudo-qualitative characteristic – see Chapter 6.3

MG, MS, VG, VS – see Chapter 4.1.5

(a)-(f) See Explanations on the Table of Characteristics in Chapter 8.1

(+) See Explanations on the Table of Characteristics in Chapter 8.2

7. Table of Characteristics/Tableau des caractères/Merkmalstabelle/Tabla de caracteres

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
1. **(*)** **(+)**	**VG/ MG**	**Plant: height**					
QN	**(a)**	short				Firebird	3
		medium				Blackout	5
		tall				Bronze Beauty	7
2. **(+)**	**VG/ MG**	**Plant: width**					
QN	**(a)**	narrow				Plum Royale	3
		medium				Blackout	5
		broad				Solar Power	7
3. **(*)**	**VG**	**Plant: density of foliage**					
QN	**(a)**	sparse				Sugar Plum	3
		medium				Mahogany	5
		dense				Brass Lantern	7
4. **(+)**	**VG**	**Young leaf blade: color one**					
PQ	**(b)** **(c)** **(d)**	RHS Colour Chart (indicate reference number)					

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
5. **(+)**	**VG**	**Young leaf blade: color one: distribution**					
PQ	**(b)**	along veins					1
	(c)	along veins and on margin					2
	(d)	between veins throughout					3
		between veins in central zone					4
		between veins in intermediate zone					5
		between veins and on margin					6
		marginal zone					7
		throughout					8
6. **(+)**	**VG**	**Young leaf blade: color one: pattern**					
PQ	**(b)**	flushed					1
	(c)	dotted					2
	(d)	blotched					3
		irregular					4
		solid or nearly solid					5
7. **(+)**	**VG**	**Young leaf blade: color one: total area**					
QN	**(b)**	small					3
	(c)	medium					5
	(d)	large					7

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
8. **(+)**	**VG**	**Young leaf blade: color two**					
PQ	**(b)** **(c)** **(d)**	RHS Colour Chart (indicate reference number)					
9. **(+)**	**VG**	**Young leaf blade: color two: distribution**					
PQ	**(b)**	none					1
	(c)	along veins					2
	(d)	along veins and on margin					3
		between veins throughout					4
		between veins in central zone					5
		between veins in intermediate zone					6
		between veins and on margin					7
		marginal zone					8
		throughout					9
10. **(+)**	**VG**	**Young leaf blade: color two: pattern**					
PQ	**(b)**	flushed					1
	(c)	dotted					2
	(d)	blotched					3
		irregular					4
		solid or nearly solid					5

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
11. **(+)**	**VG**	**Young leaf blade: color two: total area**					
QN	**(b)**	small					3
	(c)	medium					5
	(d)	large					7
12. **(+)**	**VG**	**Young leaf blade: color three**					
PQ	**(b)** **(c)** **(d)**	RHS Colour Chart (indicate reference number)					
13. **(+)**	**VG**	**Young leaf blade: color three: distribution**					
PQ	**(b)**	none					1
	(c)	along veins					2
	(d)	along veins and on margin					3
		between veins throughout					4
		between veins in central zone					5
		between veins in intermediate zone					6
		between veins and on margin					7
		marginal zone					8
		throughout					9

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
14. **(+)**	**VG**	**Young leaf blade: color three: pattern**					
PQ	**(b)**	flushed					1
	(c)	dotted					2
	(d)	blotched					3
		irregular					4
		solid or nearly solid					5
15. **(+)**	**VG**	**Young leaf blade: color three: total area**					
QN	**(b)**	small					3
	(c)	medium					5
	(d)	large					7
16. **(+)**	**VG**	**Young leaf blade: color four**					
PQ	**(b)** **(c)** **(d)**	RHS Colour Chart (indicate reference number)					

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
17. **(+)**	**VG**	**Young leaf blade: color four: distribution**					
PQ	**(b)**	none					1
	(c)	along veins					2
	(d)	along veins and on margin					3
		between veins throughout					4
		between veins in central zone					5
		between veins in intermediate zone					6
		between veins and on margin					7
		marginal zone					8
		throughout					9
18. **(+)**	**VG**	**Young leaf blade: color four: pattern**					
PQ	**(b)**	flushed					1
	(c)	dotted					2
	(d)	blotched					3
		irregular					4
		solid or nearly solid					5
19. **(+)**	**VG**	**Young leaf blade: color four: total area**					
QN	**(b)**	small					3
	(c)	medium					5
	(d)	large					7

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
20. **(*)**	**VG/ MG**	**Petiole: length**					
QN	**(e)**	short				Firebird	3
		medium				Mahogany	5
		long				Brass Lantern	7
21.	**VG**	**Petiole: pubescence**					
QN	**(e)**	absent or very sparse				Sashay	1
		sparse				Plum Royale	2
		medium				French Quarter	3
		dense				Blackout	4
22. **(*)** **(+)**	**VG**	**Petiole: main color**					
PQ	**(e)**	RHS Colour Chart (indicate reference number)					
23. **(*)** **(+)**	**VG/ MG**	**Leaf blade: length**					
QN	**(e)**	short				Firebird	3
		medium				Blackout	5
		long				Solar Power	7
24. **(*)** **(+)**	**VG/ MG**	**Leaf blade: width**					
QN	**(e)**	narrow				Firebird	3
		medium				Blackout	5
		broad					7

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
25. **(*)**	**VG/ MG**	**Leaf blade: length/width ratio**					
QN	**(e)**	very slightly compressed				Blood Red	1
		roundish				Blackout	3
		very slightly elongated				Plum Royale	5
		slightly elongated				Stoplight	7
		moderately elongated				Green Ivory	9
26. **(+)**	**VG**	**Leaf blade: shape of apex**					
PQ	**(c)**	acute				Blackout	1
	(e)	obtuse				Stoplight	2
		rounded				Mahogany	3
27. **(*)** **(+)**	**VG**	**Leaf blade: lobing**					
QN	**(c)**	absent or very shallow				Fairy Cups	1
	(e)	shallow				Blood Red	3
		medium				Sugar Plum	5
		deep				Solar Power	7
28. **(*)** **(+)**	**VG**	**<u>x Heucherella only</u>: Leaf blade: length of terminal lobe relative to total length**					
QN	**(c)**	short					3
	(e)	medium				Tapestry	5
		long				Alabama Sunrise	7

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
29. **(*)** **(+)**	**VG**	**Leaf blade: number of indentations of margin**					
QN	**(c)**	absent or very few				Fairy Cups	1
	(e)	few				Blood Red	2
		medium				Sugar Plum	3
		many				Bronze Beauty	4
		very many				Pistache	5
30. **(*)**	**VG**	**Leaf blade: depth of indentations of margin**					
QN	**(c)**	very shallow				Blood Red	1
	(e)	shallow				Pistache	2
		medium				Solar Power	3
		deep				Blackout	4
		very deep				Sashay	5
31. **(*)** **(+)**	**VG**	**Leaf blade: undulation of margin**					
QN	**(c)**	absent or very weak				Stoplight	1
	(e)	weak				TNHEU041	3
		medium				Lime Rickey	5
		strong				Chocolate Ruffles	7
32. **(+)**	**VG**	**Leaf blade: rugosity**					
QN	**(c)**	absent or very weak				Pistache	1
	(e)	weak				Brass Lantern	2
		medium				Autumn Leaves	3
		strong				Dark Inn	4

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
33. **(*)**	**VG**	**Leaf blade: glossiness**					
QN	**(c)**	absent or very weak				Pistache	1
	(e)	weak				Mahogany	2
		medium				Blackout	3
		strong				Obsidian	4
34.	**VG**	**Leaf blade: pubescence**					
QN	**(c)**	absent or very sparse				Mahogany	1
	(e)	sparse				Plum Royale	2
		medium					3
		dense				Caramel	4
35. **(*)**	**VG**	**Leaf blade: pubescence of the <u>lower</u> surface**					
QN	**(e)**	absent or very sparse				Stoplight	1
		sparse				Brass Lantern	2
		medium				Pistache	3
		dense					4
36. **(*)** **(+)**	**VG**	**Leaf blade: color one**					
PQ	**(c)** **(d)** **(e)**	RHS Colour Chart (indicate reference number)					

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
37. **(*)** **(+)**	**VG**	**Leaf blade: color one: distribution**					
PQ	**(c)**	along veins					1
	(d)	along veins and on margin					2
	(e)	between veins throughout					3
		between veins in central zone					4
		between veins in intermediate zone					5
		between veins and on margin					6
		marginal zone					7
		throughout					8
38. **(*)** **(+)**	**VG**	**Leaf blade: color one: pattern**					
PQ	**(c)**	flushed					1
	(d)	dotted					2
	(e)	blotched					3
		irregular					4
		solid or nearly solid					5
39. **(*)** **(+)**	**VG**	**Leaf blade: color one: total area**					
QN	**(c)**	small					3
	(d)	medium					5
	(e)	large					7

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
40. **(*)** **(+)**	**VG**	**Leaf blade: color two**					
PQ	**(c)** **(d)** **(e)**	RHS Colour Chart (indicate reference number)					
41. **(*)** **(+)**	**VG**	**Leaf blade: color two: distribution**					
PQ	**(c)**	none					1
	(d)	along veins					2
	(e)	along veins and on margin					3
		between veins throughout					4
		between veins in central zone					5
		between veins in intermediate zone					6
		between veins and on margin					7
		marginal zone					8
		throughout					9
42. **(*)** **(+)**	**VG**	**Leaf blade: color two: pattern**					
PQ	**(c)**	flushed					1
	(d)	dotted					2
	(e)	blotched					3
		irregular					4
		solid or nearly solid					5

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
43. **(*)** **(+)**	**VG**	**Leaf blade: color two: total area**					
QN	**(c)**	small					3
	(d)	medium					5
	(e)	large					7
44. **(*)** **(+)**	**VG**	**Leaf blade: color three**					
PQ	**(c)** **(d)** **(e)**	RHS Colour Chart (indicate reference number)					
45. **(*)** **(+)**	**VG**	**Leaf blade: color three: distribution**					
PQ	**(c)**	none					1
	(d)	along veins					2
	(e)	along veins and on margin					3
		between veins throughout					4
		between veins in central zone					5
		between veins in intermediate zone					6
		between veins and on margin					7
		marginal zone					8
		throughout					9

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
46. **(*)** **(+)**	**VG**	**Leaf blade: color three: pattern**					
PQ	**(c)**	flushed					1
	(d)	dotted					2
	(e)	blotched					3
		irregular					4
		solid or nearly solid					5
47. **(*)** **(+)**	**VG**	**Leaf blade: color three: total area**					
QN	**(c)**	small					3
	(d)	medium					5
	(e)	large					7
48. **(*)** **(+)**	**VG**	**Leaf blade: color four**					
PQ	**(c)** **(d)** **(e)**	RHS Colour Chart (indicate reference number)					

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
49. **(*)** **(+)**	**VG**	**Leaf blade: color four: distribution**					
PQ	**(c)**	none					1
	(d)	along veins					2
	(e)	along veins and on margin					3
		between veins throughout					4
		between veins in central zone					5
		between veins in intermediate zone					6
		between veins and on margin					7
		marginal zone					8
		throughout					9
50. **(*)** **(+)**	**VG**	**Leaf blade: color four: pattern**					
PQ	**(c)**	flushed					1
	(d)	dotted					2
	(e)	blotched					3
		irregular					4
		solid or nearly solid					5
51. **(*)** **(+)**	**VG**	**Leaf blade: color four: total area**					
QN	**(c)**	small					3
	(d)	medium					5
	(e)	large					7

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
52. **(*)**	**VG**	**Leaf blade: color of <u>lower side</u> (if significantly different from upper side)**					
PQ	**(e)**	RHS Colour Chart (indicate reference number)					
53. **(+)**	**VG**	**Flowering stem: attitude**					
QN		upright				Greenfinch	1
		semi-upright				Caramel	2
		spreading				Alabama Sunrise	3
54. **(*)** **(+)**	**VG/ MG**	**Flowering stem: length**					
QN		short				Mahogany	3
		medium				Brass Lantern	5
		long				French Quarter	7
55. **(*)** **(+)**	**VG**	**Flowering stem: main color**					
PQ		RHS Colour Chart (indicate reference number)					
56. **(*)** **(+)**	**VG/ MG**	**Flowering stem: length of flowering part**					
QN		short				Midnight Bayou	3
		medium				Autumn Leaves	5
		long				Havana	7

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
57. (*) (+)	**VG/ MG**	**Flowering stem: width of flowering part**					
QN		narrow				Brass Lantern	3
		medium				Lipstick	5
		broad				French Quarter	7
58. (*)	**VG/ MG**	**Flowering stem: length/width ratio of flowering part**					
QN		slightly elongated				Brass Lantern	3
		moderately elongated				Lipstick	5
		strongly elongated				Redstone Falls	7
59. (*)	**VG**	**Flowering stem: density of flowers**					
QN		sparse				White Marble	3
		medium				Solar Power	5
		dense				Vyking Ship	7
60. (*) (+)	**VG**	**Flower bud: color**					
PQ		RHS Colour Chart (indicate reference number)					
61.	**VG**	**Flower: attitude**					
(+)							
QN	**(f)**	upwards				Rickard	1
		semi-upwards				Firebird	2
		outwards				Coral Bouquet	3
		semi-downwards				White Marble	4
		downwards				Sugar Plum	5

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
62. **(*)** **(+)**	**VG/ MG**	**Flower: length**					
QN	**(f)**	short				Brass Lantern	3
		medium				Blood Red	5
		long				White Marble	7
63. **(*)** **(+)**	**VG/ MG**	**Flower: width**					
QN	**(f)**	narrow				Mahogany	3
		medium				Firebird	5
		broad				Lipstick	7
64. **(*)** **(+)**	**VG**	**Flower: color of outer surface**					
PQ	**(f)**	RHS Colour Chart (indicate reference number)					
65. **(+)**	**VG**	**<u>x Heucherella only</u>: Petal: color of inner surface**					
PQ	**(f)**	white					1
		cream					2
		pale pink					3

8. Explanations on the Table of Characteristics

8.1 Explanations covering several characteristics

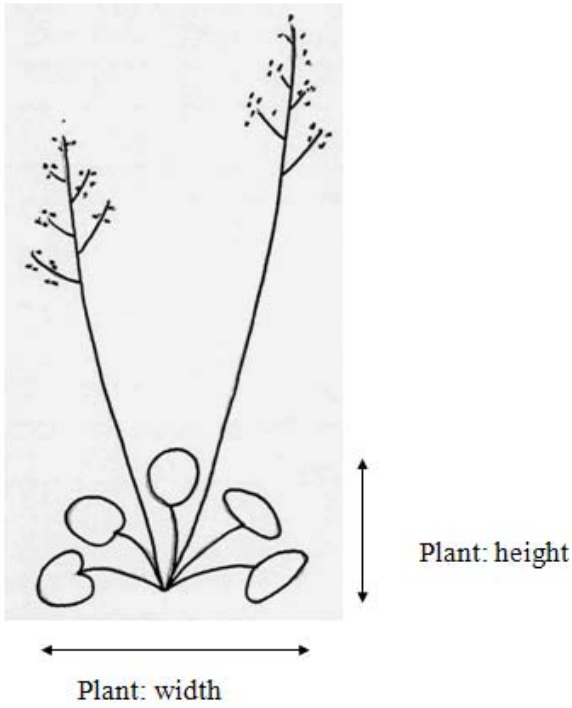
Unless otherwise indicated, all characteristics should be observed at the time of full flowering.

Characteristics containing the following key in the second column of the Table of Characteristics should be examined as indicated below:

(a) To be observed on the leaf rosette, excluding the flowering stems.
(b) To be observed on just expanded leaves of the current season.
(c) Leaf blade characteristics should be observed on the upper surface unless otherwise indicated.
(d) The color of the leaf blade excludes the color of the veins. Where the characteristic refers to colors as "one", "two" etc., they are to be recorded in the order that they appear on the RHS chart, i.e. color one is the one with the lowest number, color two with the second lowest and so on. For example, if the leaves are Green 137A dotted with White 155A, Green 137A will be color one and White 155A color two. If two colors are on the same leaf of the chart, for example Green 137A and Green 137D, 137A is regarded as the lower numbered color. It should be noted that under this system, ranking is independent of surface area, so the color covering the greatest surface area may be classified as color three or four. The Guideline makes provision for four colors; if there are more, the color[s] with the smallest surface area[s] should be discounted.
(e) To be observed on fully expanded leaves of the current season.
(f) To be observed on fully open flowers from the middle third of the flowering part of the flowering stem.

8.2 Explanations for individual characteristics

Ad. 1: Plant: height
Ad. 2: Plant: width



Ad. 4 to 19: Young leaf blade: color characteristics
Ad. 36 to 52: Leaf blade: color characteristics

In *Heuchera* and x*Heucherella* leaf color is very significant to the overall appearance of the variety. Leaves often have several colors in different patterns and the expression of these colors and patterns can change from the young leaves to the fully expanded leaves.

This guideline allows the description of up to four colors using the RHS Colour Charts as well as the distributions, the patterns formed and the areas covered. This set of characteristics is observed on the young leaves and then repeated to describe the fully expanded leaves.

Although the colors are referred to as "color one", "color two", "color three" and "color four" in the headings, this does not indicate a ranking according to prominence or area covered. The order in which the colors should be observed is dictated by the order the colors appear in the RHS Colour Chart, as described in section 8.1(d).

Example varieties have not been provided for the leaf color characteristics. This is because the number of combinations of observations that this guideline allows for, is larger than number of combinations seen. Providing example varieties for all states of expression in this case would be misleading.

In order to provide an illustration of the recording method, two worked examples are provided below. The first describes a leaf with only one color, the second a leaf with several colors. In both cases these are described on the fully expanded leaf, but the method for the young leaf is identical.

Section 8.1(b) and (e) contains the instructions as to which material should be used for the observations.

Worked Example One – 'Pistache'(variety with only one leaf color)

36. Leaf blade: color one – RHS Colour Chart – Yellow-Green 151C
37. Leaf blade: color one: distribution – throughout (8)
38. Leaf blade: color one: pattern – solid or nearly solid (5)
39. Leaf blade: color one: total area – very large (9)
40. Leaf blade: color two – RHS Colour Chart – not applicable
41: Leaf blade: color two: distribution – none (1)
42: Leaf blade: color two: pattern – not applicable
43: Leaf blade: color two: total area – not applicable
44: Leaf blade: color three – RHS Colour Chart – not applicable
45: Leaf blade: color three: distribution – none (1)
46: Leaf blade: color three: pattern – not applicable
47: Leaf blade: color three: total area – not applicable
48: Leaf blade: color four – RHS Colour Chart – not applicable
49: Leaf blade: color four: distribution – none (1)
50: Leaf blade: color four: pattern – not applicable
51: Leaf blade: color four: total area – not applicable

Worked Example Two – 'Venus' (variety with several leaf colors)

36. Leaf blade: color one – RHS Colour Chart – Yellow-Green 144C
37. Leaf blade: color one: distribution – marginal zone (7)
38. Leaf blade: color one: pattern – solid or nearly solid (5)
39. Leaf blade: color one: total area – very small to small (2)
40. Leaf blade: color two – RHS Colour Chart – Greyed-Orange 176B
41: Leaf blade: color two: distribution – along veins (2)
42: Leaf blade: color two: pattern – solid or nearly solid (5)
43: Leaf blade: color two: total area – small (3)
44: Leaf blade: color three – RHS Colour Chart – Greyed-Orange 177D but more grey
45: Leaf blade: color three: distribution – between veins in intermediate zone (6)
46: Leaf blade: color three: pattern – solid or nearly solid (5)
47: Leaf blade: color three: total area – large (7)
48: Leaf blade: color four – RHS Colour Chart – not applicable
49: Leaf blade: color four: distribution – none (1)
50: Leaf blade: color four: pattern – not applicable
51: Leaf blade: color four: total area – not applicable

The diagrams below show illustrations of the color distributions and color patterns

Ad. 5: Young leaf blade: color one: distribution
Ad. 37: Leaf blade: color one: distribution

1
along veins
(red brown)

2
along veins and on margin
(blackish)

3
between veins throughout
(red pink)

4
between veins in central zone
(grey)

5
between veins in intermediate zone
(green)

6
between veins and on margin
(yellow green)

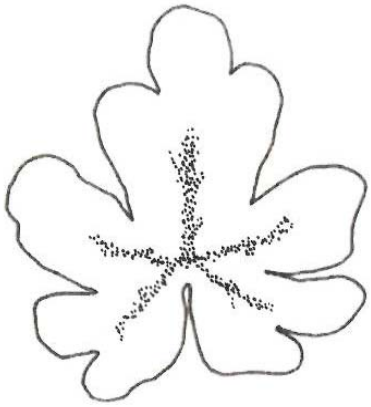
7
marginal zone
(red)

8
throughout
(pink)

Ad. 6: Young leaf blade: color one: pattern
Ad. 10: Young leaf blade: color two: pattern
Ad. 14: Young leaf blade: color three: pattern
Ad. 18: Young leaf blade: color four: pattern
Ad. 38: Leaf blade: color one: pattern
Ad. 42: Leaf blade: color two: pattern
Ad. 46: Leaf blade: color three: pattern
Ad. 50: Leaf blade: color four: pattern

1

flushed



2

dotted

3

blotched

4

irregular

5

solid or nearly solid

Ad. 9: Young leaf blade: color two: distribution
Ad. 13: Young leaf blade: color three: distribution
Ad. 17: Young leaf blade: color four: distribution
Ad. 41: Leaf blade: color two: distribution
Ad. 45: Leaf blade: color three: distribution
Ad. 49: Leaf blade: color four: distribution

The color distributions described in these characteristics can be represented by the same diagrams as in Ad. 5 and Ad. 37. However the notes are different with the first as ‘none’, to allow for varieties that do not have multiple colors.

1
none (no additional colors)

2
along veins
(red brown)

3
along veins and on margin
(blackish)

4
between veins throughout
(red pink)

5
between veins in central
zone (grey)

6
between veins in
intermediate zone (green)

7
between veins and on
margin (yellow green)

8
marginal zone
(red)

9
throughout
(pink)

Ad. 22: Petiole: main color

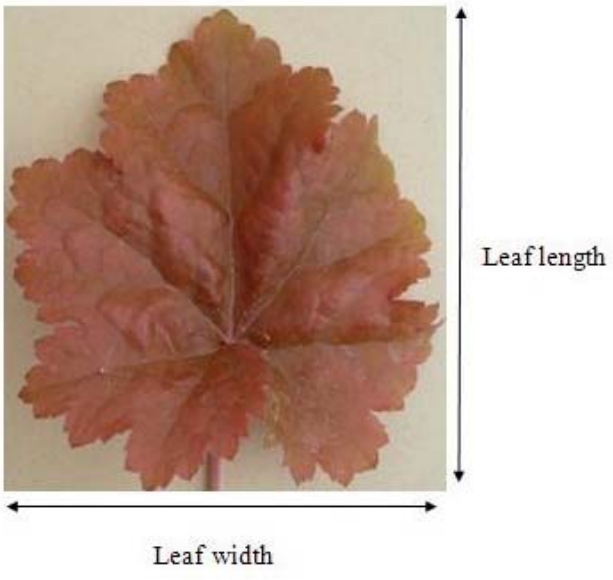
The main color is the one covering the largest surface area.

Ad. 23: Leaf blade: length

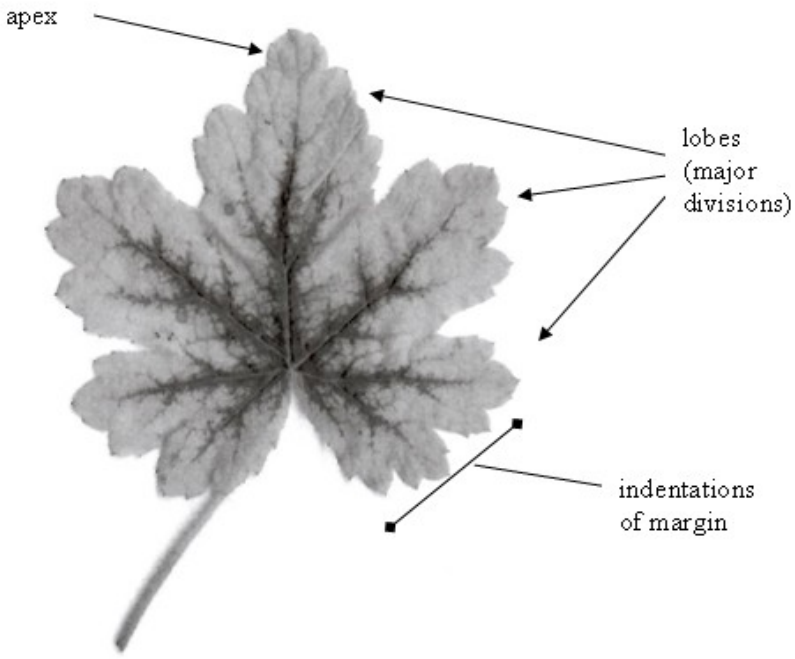
The total length of the leaf should be observed, not the distance from the petiole to the apex.

Ad. 24: Leaf blade: width

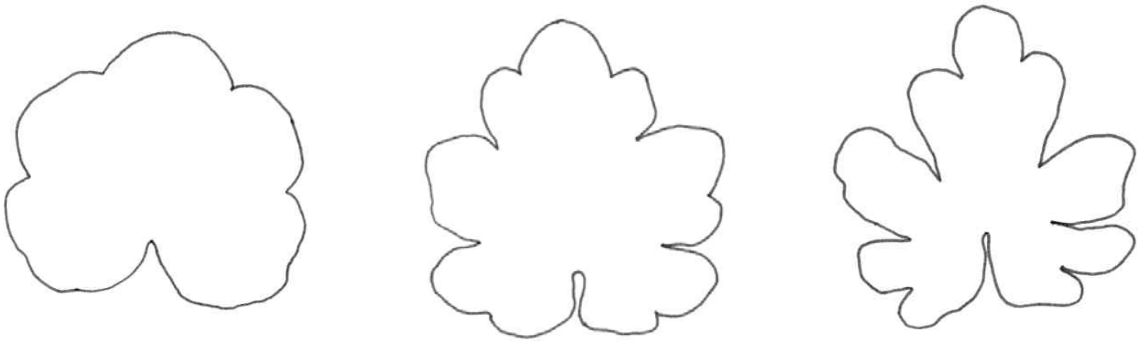
The natural width of the leaf should be observed.



Ad. 26: Leaf blade: shape of apex
Ad. 27: Leaf blade: lobing
Ad. 29: Leaf blade: number of indentations of margin

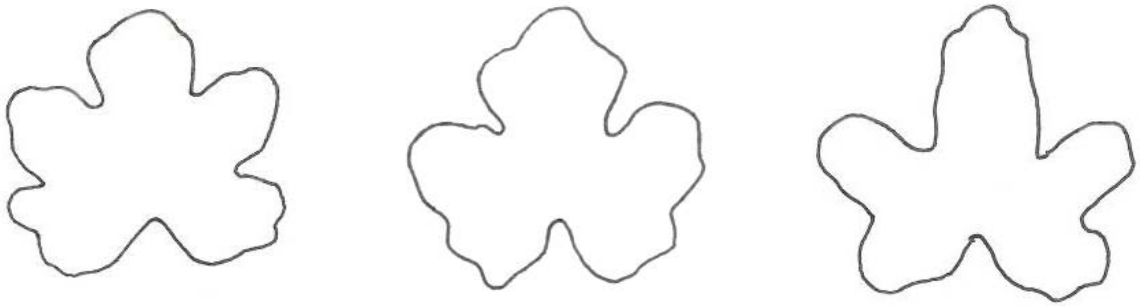


Ad. 27: Leaf blade: lobing



3	5	7
shallow	medium	deep

Ad. 28: x Heucherella only: Leaf blade: length of terminal lobe relative to total length

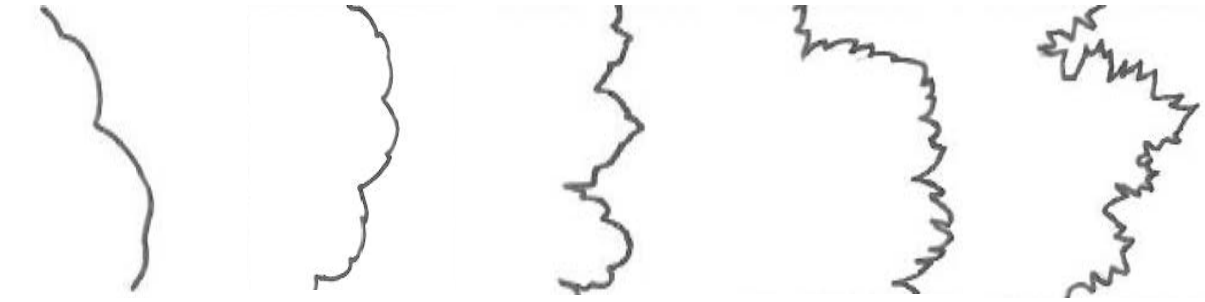


3
short

5
medium

7
long

Ad. 29: Leaf blade: number of indentations of margin



1
absent or very few

2
few

3
medium

4
many

5
very many

Ad. 31: Leaf blade: undulation of margin

1
absent or very weak

3
weak

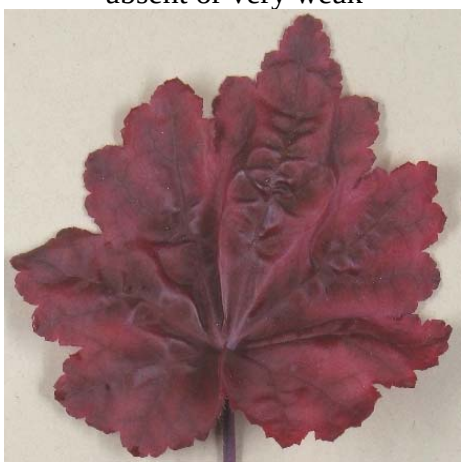
5
medium

7
strong

Ad. 32: Leaf blade: rugosity

1
absent or very weak

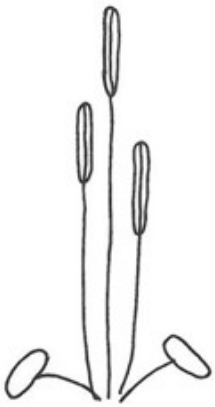
2
weak



3
medium

4
strong

Ad. 53: Flowering stem: attitude

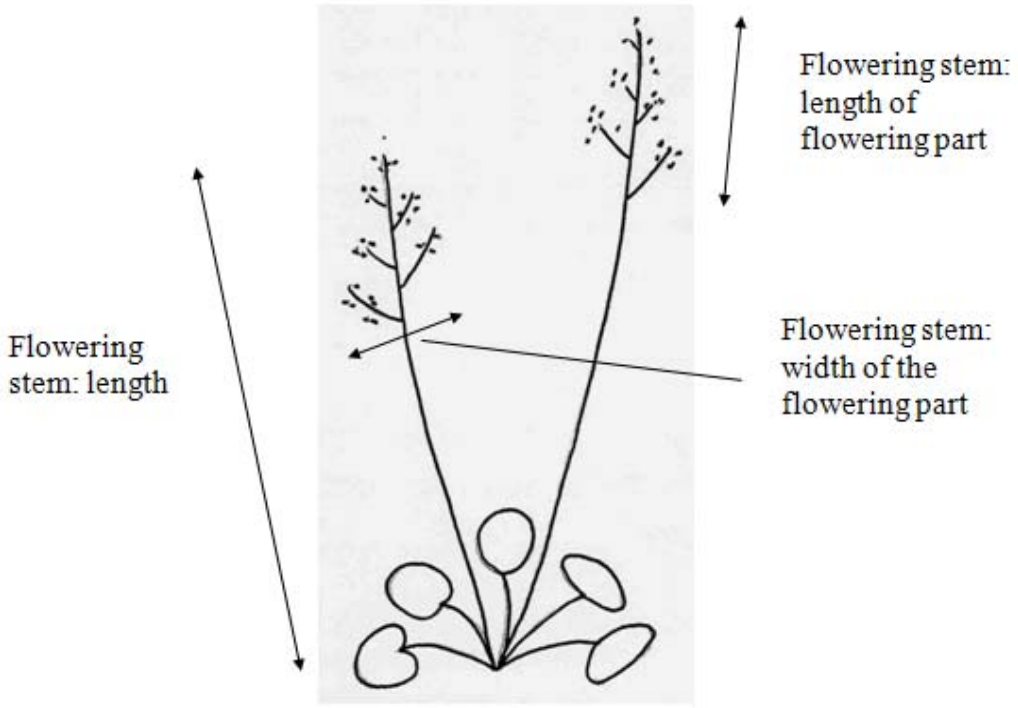


1
upright

2
semi upright

3
spreading

Ad. 54: Flowering stem: length
Ad. 56: Flowering stem: length of flowering part
Ad. 57: Flowering stem: width of flowering part



Ad. 54: Flowering stem: length

To be observed on the fully extended flowering stem.

Ad. 55: Flowering stem: main color

To be observed immediately below the flowering part of the flowering stem. The main color is the one covering the largest surface area.

Ad. 60: Flower bud: color

To be observed on a fully developed flower bud just before opening.

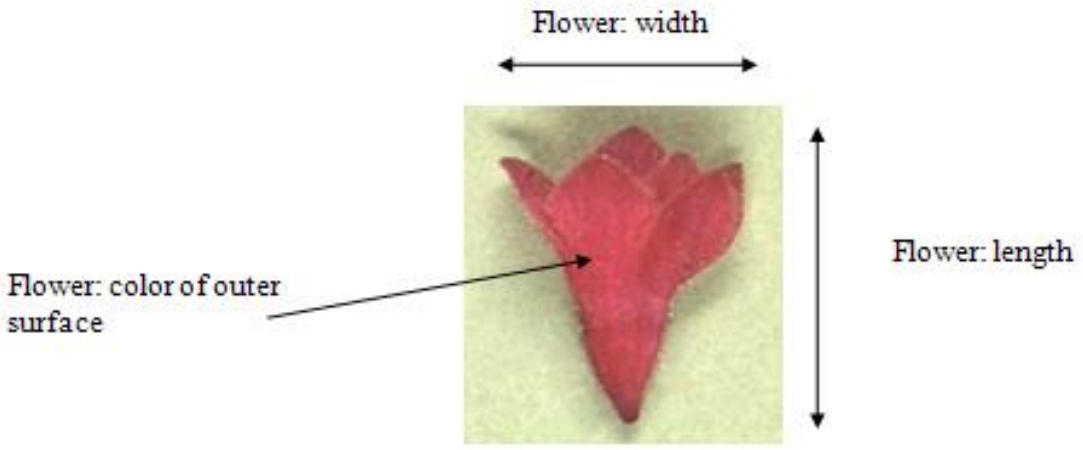
Ad. 61: Flower: attitude .

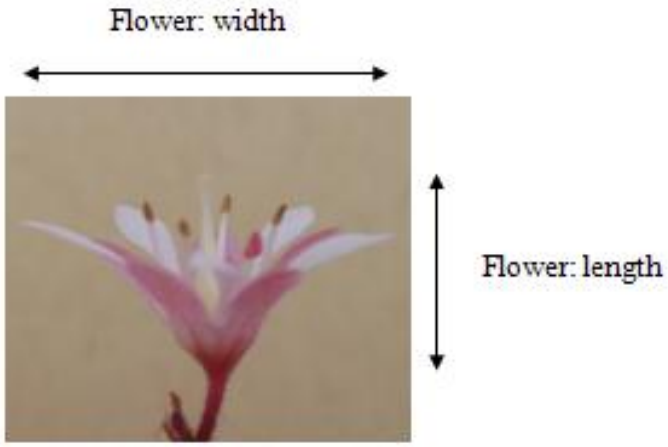
Flower attitude is described relative to the main flowering stem and excludes the angle of the pedicel.

1	2	3	4	5
upwards	semi-upwards	outwards	semi-downwards	downwards

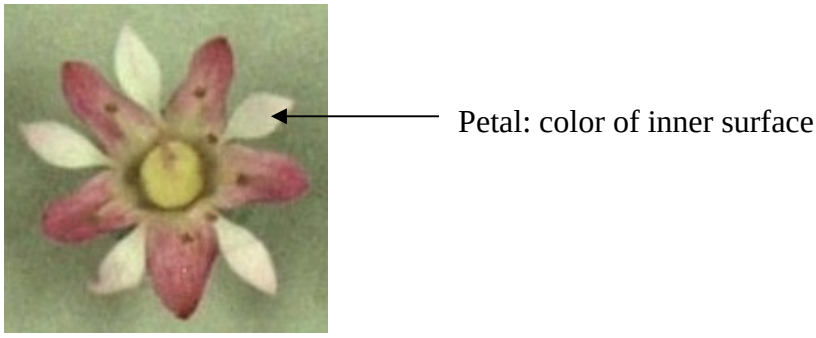
Ad. 62: Flower: length
Ad. 63: Flower: width
Ad. 64: Flower: color of outer surface

Note on the flower structure: In the flowers, the lower parts of the calyx, petals and anthers are fused together into a structure called the Hypanthium. At the base of each calyx lobe a small petal is attached, which may be vestigial or may project past the mouth of the flower. The petals are generally more prominent in x*Heucherella*.





Ad. 65: x Heucherella only: Petal: color of inner surface



9. Literature

Heims, D., and Ware, G., 2005: Heucheras and Heucherellas, Coral Bells and Foamy Bells. Timber Press, Inc.. Oregon, US

Oliver, C. and M., 2006: Heuchera, Tiarella and Heucherella, A Gardener's Guide. B. T. Batsford Ltd.. London, GB

10. Technical Questionnaire

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:

	Application date: (not to be filled in by the applicant)

TECHNICAL QUESTIONNAIRE
to be completed in connection with an application for plant breeders' rights

1. Subject of the Technical Questionnaire (please indicate the relevant genus:)

1.1	Botanical name	*Heuchera* L.	[ ]
1.2	Common name	Heuchera	
1.3	Species (please complete)		
1.1	Botanical name	x*Heucherella* H. R. Wehrh.	[ ]
1.2	Common name	Heucherella	

2. Applicant

Name	
Address	
Telephone No.	
Fax No.	
E-mail address	
Breeder (if different from applicant)	

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:

3. Proposed denomination and breeder's reference

Proposed denomination (if available)	
Breeder's reference	

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:

[#]4. Information on the breeding scheme and propagation of the variety

4.1 Breeding scheme

Variety resulting from:

4.1.1 Crossing

(a) controlled cross [ ]
(please state parent varieties)

(……..……..…) x (……..……..…)
female parent male parent

(b) partially known cross [ ]
(please state known parent variety(ies))

(……..……..…) x (……..……..…)
female parent male parent

(c) unknown cross [ ]

4.1.2 Mutation [ ]
(please state parent variety)

4.1.3 Discovery and development [ ]
(please state where and when discovered and how developed)

4.1.4 Other [ ]
(please provide details)

[#] Authorities may allow certain of this information to be provided in a confidential section of the Technical Questionnaire.

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:

4.2 Method of propagating the variety

4.2.1 Vegetative propagation

(a) cuttings [ ]

(b) *in vitro* propagation [ ]

(c) other (state method) [ ]

4.2.2 Seed [ ]

4.2.3 Other [ ]

(please provide details)

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:

5. Characteristics of the variety to be indicated (the number in brackets refers to the corresponding characteristic in Test Guidelines; please mark the note which best corresponds).

	Characteristics	Example Varieties	Note
5.1 (1)	**Plant: height**		
	very short	Blood Red	1[ ]
	very short to short		2[ ]
	short	Firebird	3[ ]
	short to medium		4[ ]
	medium	Blackout	5[ ]
	medium to tall		6[ ]
	tall	Bronze Beauty	7[ ]
	tall to very tall		8[ ]
	very tall		9[ ]
5.2 (27)	**Leaf blade: lobing**		
	absent or very shallow	Fairy Cups	1[ ]
	very shallow to shallow		2[ ]
	shallow	Blood Red	3[ ]
	shallow to medium		4[ ]
	medium	Sugar Plum	5[ ]
	medium to deep		6[ ]
	deep	Solar Power	7[ ]
	deep to very deep		8[ ]
	very deep	Kimono	9[ ]

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:

	Characteristics	Example Varieties	Note
5.3 (31)	**Leaf margin: undulation of margin**		
	absent or very weak	Stoplight	1[ ]
	very weak to weak		2[ ]
	weak	TNHEU041	3[ ]
	weak to medium		4[ ]
	medium	Lime Rickey	5[ ]
	medium to strong		6[ ]
	strong	Chocolate Ruffles	7[ ]
	strong to very strong		8[ ]
	very strong	Green Ivory	9[ ]

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:

	Characteristics	Example Varieties	Note
5.4	**Young just expanded leaf: color covering the greatest surface area**		
	white		1[ ]
	light yellow		2[ ]
	medium yellow		3[ ]
	yellow green	Lime Rickey	4[ ]
	light green		5[ ]
	medium green		6[ ]
	dark green	Sashay	7[ ]
	yellow brown	Amber Waves	8[ ]
	pink	Peachy Keen	9[ ]
	red	Peach Flambe	10[ ]
	red brown	Tiramisu	11[ ]
	brown	Café Ole	12[ ]
	purple		13[ ]
	grey purple	Frosted Violet	14[ ]
	grey green		15[ ]
	grey		16[ ]
	blackish		17[ ]

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:

	Characteristics	Example Varieties	Note
5.5	**Fully expanded leaf: color covering the greatest surface area**		
	white	Snow Storm	1[ ]
	light yellow		2[ ]
	medium yellow	Stoplight	3[ ]
	yellow green	Pistache	4[ ]
	light green		5[ ]
	medium green	Firebird	6[ ]
	dark green	Sashay	7[ ]
	yellow brown	Amber Waves	8[ ]
	pink		9[ ]
	red	Autumn Leaves	10[ ]
	red brown	Brass Lantern	11[ ]
	brown	Bronze Beauty	12[ ]
	purple	Midnight Rose	13[ ]
	grey purple	Sugar Plum	14[ ]
	grey green	Kimono	15[ ]
	grey	Venus	16[ ]
	blackish	Obsidian	17[ ]

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:

	Characteristics	Example Varieties	Note
5.6	**Fully expanded leaf: color covering the next greatest surface area**		
	white		1[ ]
	light yellow		2[ ]
	medium yellow	Tiramisu	3[ ]
	yellow green		4[ ]
	light green		5[ ]
	medium green	Snow Storm	6[ ]
	dark green		7[ ]
	yellow brown	Bronze Beauty	8[ ]
	pink	Midnight Rose	9[ ]
	red	Brass Lantern	10[ ]
	red brown	Stoplight	11[ ]
	brown	Venus	12[ ]
	purple	Sugar Plum	13[ ]
	grey purple		14[ ]
	grey green		15[ ]
	grey		16[ ]
	blackish	Kimono	17[ ]

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:

	Characteristics	Example Varieties	Note
5.7	**Fully expanded leaf: color covering the next greatest surface area: distribution**		
	along veins	Venus	1[ ]
	along veins and on margin	Sugar Plum	2[ ]
	between veins throughout	Bronze Beauty	3[ ]
	between veins in central zone		4[ ]
	between veins in intermediate zone		5[ ]
	between veins and on margin	Tiramisu	6[ ]
	marginal zone		7[ ]
	throughout	Midnight Rose	8[ ]
5.8 (64)	**Flower: color of outer surface**		
	greenish	Shamrock	1[ ]
	white	White Marble	2[ ]
	cream	Ebony and Ivory	3[ ]
	light pink	Vyking Ship	4[ ]
	medium pink	Coral Bouquet	5[ ]
	dark pink	Stawberry Candy	6[ ]
	red	Blood Red	7[ ]

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:

6. Similar varieties and differences from these varieties

Please use the following table and box for comments to provide information on how your candidate variety differs from the variety (or varieties) which, to the best of your knowledge, is (or are) most similar. This information may help the examination authority to conduct its examination of distinctness in a more efficient way.

Denomination(s) of variety(ies) similar to your candidate variety	Characteristic(s) in which your candidate variety differs from the similar variety(ies)	Describe the expression of the characteristic(s) for the **similar** variety(ies)	Describe the expression of the characteristic(s) for **your** candidate variety
Example	*Leaf: color of upper surface*	*yellow brown*	*light green*

Comments:

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:

[#]7. Additional information which may help in the examination of the variety

7.1 In addition to the information provided in sections 5 and 6, are there any additional characteristics which may help to distinguish the variety?

Yes [ ] No [ ]

(If yes, please provide details)

7.2 Are there any special conditions for growing the variety or conducting the examination?

Yes [ ] No [ ]

(If yes, please provide details)

7.3 Other information

A representative color image of the variety should accompany the Technical Questionnaire.

8. Authorization for release

(a) Does the variety require prior authorization for release under legislation concerning the protection of the environment, human and animal health?

Yes [ ] No [ ]

(b) Has such authorization been obtained?

Yes [ ] No [ ]

If the answer to (b) is yes, please attach a copy of the authorization.

[#] Authorities may allow certain of this information to be provided in a confidential section of the Technical Questionnaire.

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:

9. Information on plant material to be examined or submitted for examination.

9.1 The expression of a characteristic or several characteristics of a variety may be affected by factors, such as pests and disease, chemical treatment (e.g. growth retardants or pesticides), effects of tissue culture, different rootstocks, scions taken from different growth phases of a tree, etc.

9.2 The plant material should not have undergone any treatment which would affect the expression of the characteristics of the variety, unless the competent authorities allow or request such treatment. If the plant material has undergone such treatment, full details of the treatment must be given. In this respect, please indicate below, to the best of your knowledge, if the plant material to be examined has been subjected to:

(a) Microorganisms (e.g. virus, bacteria, phytoplasma) Yes [ ] No [ ]

(b) Chemical treatment (e.g. growth retardant, pesticide) Yes [ ] No [ ]

(c) Tissue culture Yes [ ] No [ ]

(d) Other factors Yes [ ] No [ ]

Please provide details for where you have indicated “yes”.

……

10. I hereby declare that, to the best of my knowledge, the information provided in this form is correct:

Applicant’s name

Signature Date

[End of document]